RIDOLFI
Environmental

MEMORANDUM

DATE: September 1, 2015

TO: Rose Longoria, Yakama Nation Fisheries

FROM: Callie A. Ridolfi, P.E.

SUBJECT: Portland Harbor Feasibility Study (FS) Significant Issues

This is to provide comments on significant issues related to EPA's recent release of the Portland Harbor draft Feasibility Study (the FS). EPA has requested identification of significant issues by September 2 and other comments by October 10, 2015.

We have organized our comments according to the CERCLA Feasibility Study evaluation criteria. Unfortunately, none of the alternatives developed by EPA and evaluated in the FS result in the cleanup of contaminated sediment to background concentrations or to concentrations that represent risk reduction to within EPA's acceptable risk range. In fact, even Alternative G, the most aggressive alternative in terms of active remediation, fails to meet the threshold criteria.

Compliance with ARARs

The discussion provided in the FS is overly general and does not provide enough information to determine compliance with ARARs. Further, it fails to discuss, or does not demonstrate compliance with, certain ARARs discussed in Section 2 of the FS, including state narrative water quality standards or measures of protectiveness of human health and the environment. *(Note however, that for all alternatives other than No Action, the FS states that the alternative "would comply with ARARs.")*

Chemical-specific ARARs

The evaluation of compliance with chemical-specific ARARs, for all action alternatives, states that "[c]hemical specific ARARs would be met over time through implementation of a combination of in-river remedial technologies."

For compliance with chemical-specific ARARs based on water quality standards, the FS states that "[i]mplementation of the alternative in conjunction with adequate upland source control measures over time are not expected to cause or contribute to exceedances of numeric human health and aquatic life water quality criteria."

The FS acknowledges, however, that "there are no current means to quantitatively assess the

effectiveness of the remedial activities on overall concentrations in beaches, surface water, and pore water", and that the "[t]ime to achieve protectiveness" is "uncertain."

Long-term monitoring of the site of surface water, pore water, sediments upstream and downstream will be key to gaging the effectiveness of the cleanup in meeting ARARs. It would be helpful to provide more detail on the elements and expectations of a monitoring program in the FS.

Narrative Criteria

FS section 2.1.1, on chemical-specific ARARs, states: "In addition to numeric water quality criteria, Oregon narrative water quality criteria are potential ARARs that EPA will translate into numeric standards for each COC through the final remediation goals." Relevant narrative criteria in the Oregon water quality standards include the following:

> *Toxic substances may not be introduced above natural background levels in waters of the state in amounts, concentrations, or combinations that may be harmful, may chemically change to harmful forms in the environment, or may accumulate in sediments or bioaccumulate in aquatic life or wildlife to levels that adversely affect public health, safety, or welfare or aquatic life, wildlife, or other designated beneficial uses. (OAR 340-041-0033)*
>
> *The formation of appreciable bottom or sludge deposits or the formation of any organic or inorganic deposits deleterious to fish or other aquatic life or injurious to public health, recreation, or industry may not be allowed. (OAR 340-041-0007(11))*

Because all proposed alternatives are deemed "not within acceptable risk range post-construction" for RAO 2 (fish/shellfish consumption), they should be considered to "adversely affect public health, safety, or welfare", and would therefore not be in compliance with state narrative water quality standards (an ARAR).

Overall Protection of Human Health and the Environment

Based on the approach defined in Section 4.1.4 for assessing the protection of human health, none of the proposed alternatives would be considered protective of human health.

> According to Section 4.1.4 "The protection of human health is assessed by comparing the PRGs for RAOs 1 (sediment only) and 2 to estimated contaminant concentrations in sediment at the completion of construction."
>
> According to Table 4.3-1, for all alternatives, RAO 2 is "Not within acceptable risk range post-construction."

Because protection of human health is based on assessing RAOs 1 and 2 at the completion of construction, and because no alternative is within the acceptable risk range for RAO 2 at the

completion of construction, no alternative would be considered protective of human health.

Because upstream and upland sources and groundwater inputs contribute to this CERCLA site, Clean Water Act authorities for discharge permits and enforcement actions must be considered. How will CWA efforts be implemented to assure that upstream waters meet water quality standards? It would be beneficial for EPA to include an explanation of the collaboration efforts that will be conducted by the Water, Superfund, and Enforcement programs to affect a successful cleanup.

Unfortunately, the use of modeling to evaluate the effectiveness of the alternatives in reducing risk over the long-term was determined to be infeasible given the complexities of the site and the schedule for the project. How will EPA assure that the remedial action objectives will be met?

Measures of Protectiveness

FS section 2.1.1 also states that measure of protectiveness of human health and the environment included in the Oregon Hazardous Substance Remedial Action Rules "are considered applicable to the Portland Harbor site." These include:

- A 1 in 1,000,000 (1×10^{-6}) lifetime excess cancer risk for individual carcinogens
- A 1 in 100,000 (1×10^{-5}) cumulative lifetime excess cancer risk for multiple carcinogens
- A hazard index (HI) of 1 for non-carcinogens

However, "acceptable risk ranges" considered in the FS appear to be based not on these values, but on a broader and less protective risk range used by EPA. For example, in Section 4.2.2.3, it is stated that "Estimated post-construction cancer risks…are generally less than 5×10^{-5}, which is within EPA's acceptable risk range." However, this exceeds the acceptable risk range of 1×10^{-5} which was determined to be an ARAR.

Fish Consumption Advisories

In 2000, the EPA published guidance and recommendations on the use of fish and shellfish consumption advisories in determining attainment of water quality standards and listing impaired waterbodies under section 303(d) of the Clean Water Act (CWA) (EPA, 2000), which includes the following statement:

> EPA generally believes that fish and shellfish consumption advisories and certain shellfish growing area classifications based on waterbody specific information demonstrate impairment of CWA section 101(a) "fishable" uses. This applies to fish and shellfish consumption advisories and certain shellfish area classifications for all pollutants that constitute potential risks to human health, regardless of the source of the pollutant.

Section 4.1.4 of the FS states that:

To determine whether the tissue PRGs for RAO 2 are expected to be achieved, predicted

concentrations in sediment at MNR Year 0 are used to estimate concentrations in fish and shellfish tissue. Where the estimated tissue concentrations exceed PRGs for RAO 2, then it will be assumed that a fish consumption advisory will be necessary to provide protection in the short- and/or long-term.

Based on Table 4.3-1, none of the proposed alternatives would be within the acceptable risk range post-construction for RAO 2. This would imply that a fish consumption advisory will be necessary following the implementation of any of the alternatives. Based on EPA guidance, this would demonstrate impairment of the fishable use of waters in the project area, and would therefore not be considered in compliance with ARARs based on state water quality standards.

Balancing Criteria

Long-Term Effectiveness and Permanence
EPA should evaluate how known geologic hazards, specifically seismic shaking intensity, amplification and liquefaction, impact the reliability, long-term effectiveness, and permanence of the remedial alternatives.

Some helpful resources are a map at https://www.portlandoregon.gov/pbem/article/394641 created by the Portland Bureau of Emergency Management (PBEM) that compiles information from a variety of existing sources; including data from the U.S. Geological Survey (USGS), Federal Emergency Management Agency (FEMA) and Oregon Department of Geology and Mineral Industries (DOGAMI).

Also, Hazvu is a web viewer created by Oregon Department of Geology and Mineral Industries (DOGAMI) by compiling information from a variety of existing sources; including data from the U.S. Geological Survey (USGS), Oregon Department of Land Conservation and Development (DLCD), Pacific Northwest Seismic Network (PNSN), and Federal Emergency Management Agency (FEMA). http://www.oregongeology.org/hazvu/

Also, to what extent does climate change impact the reliability, long-term effectiveness, and permanence of the remedial alternatives? Key potential climate change impacts that may be expected for the Portland Harbor include increased heavy precipitation events, sea level rise, and increased flood risk.

Reduction of Toxicity, Mobility, or Volume through Treatment
Based upon the comparative analyses presented in Section 4 and Table 4.3-1 there is little difference in the results between Alternatives B through G with the exception of the remaining PTW and corresponding magnitude of residual risks at construction completion. How might EPA more quantitatively measure the short- and long-term benefits of Alternative G over B?

Section 4.1.6 states, "The evaluation of long-term effectiveness and permanence evaluation starts at the time RAOs and PRGs are met." However, the FS states that the alternatives

presented will not achieve RAOs and PRGs and the time frame to achieve them is uncertain. So how was the evaluation performed?

Present Value Cost

It appears that costs for waste transport and disposal were from assuming the Roosevelt Landfill location and the Landfill Group location in Arlington, OR. The sites are similar distances from Portland and cost will be similar. However, the Roosevelt Landfill is an unacceptable disposal site from Yakama Nation's perspective.

An evaluation of the overdredge allowance of 1.75 (2.0 high/ 1.5 low) is required. Recent work conducted in the Pacific Northwest has included a comparison of pre- and post-dredging volumes of EPA dredging projects which concluded an average volume of allowance to be 1.38. The same project used a volume allowance factor of 1.5 (AECOM 2012, *Final Feasibly Study Lower Duwamish Waterway, Appendix E Methods for Calculating the Volume of Contaminated Sediments Potentially Requiring Remediation and Appendix I Detailed Cost Estimates.* Prepared for the Lower Duwamish Waterway*)*.